



What's New

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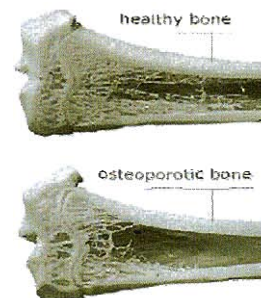
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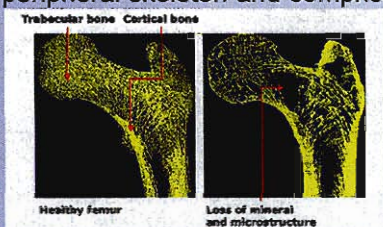
APFRI Recognizes May as National Osteoporosis Awareness & Prevention Month

By Melanie Richardson, Exercise Physiologist

Osteoporosis is a systemic skeletal disease characterized by low bone mass and micro architectural deterioration of bone tissue, leading to enhanced bone fragility and a consequent increase in risk of fracture.¹ According to the National Osteoporosis Foundation, an estimated 10 million Americans have osteoporosis and approximately 34 million also have low bone mass density, constituting a very serious predisposition for the development of osteoporosis.² Many factors predispose an individual to osteoporosis, including, family history, gender, menopause after the age of 50 years, Caucasian/Asian race, low body weight, premature menopause, excessive alcohol intake, smoking, low dietary calcium and Vitamin D intake and *lack of physical activity*. The most devastating by-product of this disease is bone fracture, often resulting in loss of normal daily function, even death. The most common sites for fracture are the hip, wrist and spine. The fear of future fracture causes an individual to reduce physical activity, thus exacerbating the condition.

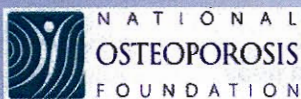


To fully understand this devastating and preventable disease, a base knowledge of human bone is beneficial. The human body has two kinds of bone: cortical and trabecular. Cortical (calcified) bone is the peripheral skeleton and comprises about 80% of the total skeleton. Trabecular (spongy) bone comprises the axial skeleton including the spinal column, pelvis and femur. Bone is living, dynamic tissue that constantly undergoes "remodeling". The purpose of remodeling is to maintain mechanical integrity of tissue by replacing fatigue-damaged, older bone with new bone. Osteoporosis develops when old bone is not replaced by new bone, as shown in the difference between a healthy femur and one already weakened structurally.



Statistics:

- Of the 10 million Americans estimated to have osteoporosis, eight million are women, two million are men.
- One in two women and one in four men over age 50 will have an osteoporosis-related fracture in his/her lifetime.
- Ten million people in the U.S. over the age of 50 have osteoporosis of the hip.³



The National Osteoporosis Foundation recommends five steps to prevent the onset of osteoporosis:

1. **A balanced diet in calcium and Vitamin D intake:** Poor nutrition is a risk factor for osteoporosis. Calcium and Vitamin D are involved in the maintenance of the skeleton, along with protein, phosphorous and magnesium. Bone is the mineral reservoir in the maintenance of calcium equilibrium. Approximately 99% of the body's calcium is stored in bone, with the remaining balance of calcium involved in a variety of other functions such as nerve transmission and muscular contraction. When dietary intake and absorption of calcium is inadequate, calcium is taken from bone for use in essential functions in the body.⁴ One cup (8 oz) of low-fat milk provides 300 mg of calcium. A good vegetarian alternative would be one cup of raw chopped broccoli which provides 40 mg calcium.



Recommended Daily Calcium Intake

Ages	Daily Calcium Intake
1 – 8 years	500 – 800 mg·day
9 – 18 years	1300 mg·day
19 – 50 years	1000 mg·day
51 plus years	1200 mg·day

Vitamin D plays a critical role in the absorption of calcium and is necessary in the preservation of bone health. Vitamin D is naturally formed in the body after 15 minutes of exposure to sunlight. If exposure to sunlight is not favorable or possible, Vitamin D may also come from fortified milk or other dietary supplements. Fatty fish and whole grain products are also excellent sources for Vitamin D. The USDA recommends a daily intake of 200 International Units (IU) for both men and women under 50 years of age; 400 IU between 50-70 years of age, and 600 IU for those over the age of 70 years.

2. **Weight bearing and strength training exercises:** Physical inactivity is another risk factor for osteoporosis. Many studies have found that physically active individuals and athletes have higher bone mass than their sedentary counterparts. Individuals who regularly perform resistance/strength training exercises typically have higher bone mass at the hip and spine than non-strength training individuals.⁵ Individuals who participate in activities without high impact forces, e.g., swimming, have lower bone mass than those engaged in weight-bearing activities.⁶ While swimming is a wonderful form of aerobic exercise, the degree of resistance is only that of the water against the body as it slices through the water. Resistance may be slightly greater by using devices such as pull buoys or flippers. Activities with a high impact, or high ground reaction force, are those typically defined as having a "flight phase." This means one or both feet are off the ground or surface area at the same time, like running, jogging, jumping or hopping. The act of walking confers little in high ground reaction forces because there is no flight phase. The gravitational pull back to the ground from jumping for instance, provides the type of stimulus the bones need to make new bone.

Resistance/strength, balance and agility training can improve balance, agility and strength in those at risk for osteoporosis.⁷ While the definitions of resistance versus strength training differ slightly, this type of training provides adequate stimulus through the muscular system to renew bone structure. A good example of resistance training is swimming, as mentioned above. Although not the preferred method to increase or maintain bone structure, it sufficiently augments any formal strength training program. Strength training is a means of educating the large muscle groups of the body to have the capacity for exertion or endurance. Performing strength exercises will cause the muscles to contract, thereby producing the required amount of force to move the weight. Because muscles are attached to bony structures, the force produced while lifting causes the bone to generate new bone. Agility and balance exercises help prevent falls that could result in a fracture. This type of training increases the body's awareness of where it is in space. By performing balance and agility drills regularly will help prevent falls which could lead to fractures.



Strength Training ~ Perform 2 - 3 Times Per Week

- Start a strength training program
- Progress to multi-joint exercises
- Hip adduction / abduction exercises
- Amount of weight *must* produce muscle fatigue



High Ground Reaction Forces

- Hopping – lateral hops, jumping jacks, one footed hops
- Jumping rope
- Playing soccer



Aerobic Exercise

- At least 30 minutes on most, if not all, days of the week
- Jogging / running / brisk walking
- Agility / balance training twice per week

Caution: Seek advice from your health care provider if you have already been diagnosed with osteoporosis and not currently engaged in a regular exercise program.

APFRI offers two on-going classes that provide information on types of training that will help increase or maintain bone density and structure. APFRI encourages attending both the APFRI Strength Training Fundamentals and BOSU Ball (balance) classes. These classes place a heavy emphasis on this type of training in the prevention of osteoporosis for both men and women.

Strength Training Fundamentals: This hands-on class will provide both the fundamental knowledge for a beginning level strength training program and an entrance level exercise prescription, to include the appropriate number of sets and repetitions. Class participants will understand the importance of this type of training as it relates to bone health, maintaining lean muscle mass and normal daily function. Participants will need to dress in appropriate exercise attire to serve as active participants.

BOSU Ball: This class is designed to teach participants how to improve balance, posture, and functional movement using a device called the BOSU ball. Participants will learn exercises that will enhance coordination, agility, core and overall strength, and flexibility.

3. **Avoid smoking and excessive alcohol intake:** The nicotine from cigarettes interferes with the absorption of calcium and other nutrients. Several studies have disclosed an association between present and past smoking and low bone mass and fractures in post menopausal women. Excessive alcohol intake (over 7 drinks / week for women) has been shown to lower bone mass, while moderate alcohol consumption has no negative effect on bone.
4. **Talk to your doctor about bone health:** Even before changes in bone mass can occur, it is important to speak with your healthcare provider about bone health. A simple series of questions will help you understand this disease and your own risk for the disease. Ask questions about your medical, family and lifestyle history. Ask how to best prevent osteoporosis and what dietary and exercise modifications must be made to help prevent this disease. Ask about your own risk for fracture and when to have a baseline bone mass test.
5. **When appropriate, bone density testing and medication:** Bone mineral density (BMD) testing is highly recommended for all women age 65 years and older. BMD testing for younger postmenopausal women is recommended especially when one or more risk factors exist.⁸

Medical experts agree that osteoporosis is highly preventable. While there is no cure for osteoporosis, the steps listed above provide a means to prevent further bone loss.

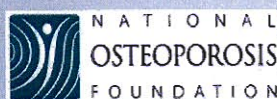
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5. Conroy, BR et al. Bone mineral density in elite junior Olympic weightlifters. Med Sci Sports Exerc 25:1103-1109, 1993.
6. Taaffe DR et al. Differential effects of swimming versus weight bearing activity on bone mineral status of eumenorrheic athletes. J Bone Miner Res 10:586-593, 1995.
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8. The National Osteoporosis Foundation.



Websites:

The National Osteoporosis Foundation
<http://www.nof.org/>
National Institute of Health
<http://www.osteoporosis.nih.gov/>
International Osteoporosis Foundation
<http://www.iofbonehealth.org>



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